

Roentgenograms. Usual features were described.^{194, 529} According to Haggart roentgenograms of knees in osteo-arthritis consistently reveal degenerative changes about the patella although arthritic changes may not be visible in other parts of the joint. Enlargement of the patella, exostoses on the proximal and distal ends of bone and narrowing of joint space are frequent findings. Roentgenograms rarely give an accurate idea of the degree of cartilage degeneration and erosion which is actually found at operation. Loss of joint space, subchondral osteosclerosis, and osteophytes are the three cardinal signs of osteo-arthritis (Plewes).

Pathology. Pathologic features were reviewed.^{283, 285, 529, 538} The most common operative findings in a severely involved knee are marked synovial hyperplasia, erosion and degeneration of articular cartilage particularly over femoral condyles, thinning and fibrillation of patellar cartilage, hypertrophy of patella and exposure with eburnation of the subchondral bone (Haggart). Degeneration of femoral cartilage was consistently most pronounced in the patellar groove.

[Synovial hyperplasia is not a characteristic feature in pure osteo-arthritis; when present it probably signifies the presence of a mixed type of arthritis.—Ed.]

Laboratory Data. Sedimentation rates are often elevated.^{464, 599} Formol-gel reactions are occasionally positive.⁴⁹⁸ [The abnormal sedimentation rates and formol-gel reactions are probably caused by factors other than the osteo-arthritis.—Ed.] Blood plasma may contain increased amounts of substances which reduce chromic acid.¹⁴⁷

Etiology. 1. *Factors of Tissue Senescence and Trauma.* Cartilage degeneration from increasing age, "wear and tear," and repeated or severe single trauma were considered most important.^{212, 283, 285, 455, 538} In 50 per cent of Plewes' cases of unilateral painful hips there was roentgenographic evidence of symptomless osteo-arthritis in the opposite hip. He assumed that the "wear and tear" of daily life produced symptomless changes in both hips; on the injured side trauma accelerated the process to the point of pain.

2. *Factor of Impaired Circulation.* This was discussed but no new data were presented.^{212, 453, 538}

3. *Factor of Endocrine Dysfunction.* Hoskins described a hypothyroid and a menopausal type of osteo-arthritis but failed to present convincing data to support such classification.

[Claims made by some that endocrine dysfunction plays an etiologic rôle in osteo-arthritis are based on vague clinical impressions and are not supported by adequate biochemical evidence.—Ed.]

4. *Factor of Altered Metabolism.* The belief that an abnormal sulfur metabolism exists in osteo-arthritis has been based on the inconsistent findings of a lowered cystine content in finger nails,²⁸⁵ a reduced sulfur content of articular cartilage¹⁰⁹ and the frequent excretion of free indole in the urine of arthritic patients.²⁰⁰ But Freyberg, Block and Fromer could not demonstrate important abnormalities in sulfur excretion of such patients.

usually recommended for adults, but Speed believes the procedure may be safely used for adolescents more than 16 years of age whose acetabula are fully ossified. Arthroplasty of the ankle was not recommended because the resulting articulation is often painful and may cause more disability than that incident to ankylosis (Speed and Smith). Synovectomy was considered valuable for the relief of "painful arthritic knees" (Carruthers). [Description of the types of arthritis referred to was vague.—Ed.] Haggart advised operative removal of all abnormalities (in so far as is feasible) in cases of advanced osteoarthritis of knees: combined excision of the patella, synovectomy, removal of exostoses and shaving of degenerated cartilage were attended by improvement in 19 of 20 cases.

BACKBONE AND SCIATICA

General Remarks on the Causes of Backache and Sciatica. For this section on backache and sciatica we reviewed more than 90 papers. Since most of the reports of 1940 on backache concerned data repetitions of material in recent Reviews we shall only cite the more significant papers. The various causes of backache and their distinction, with illustrative case reports and methods for examining backs were reviewed.^{35, 302, 342, 408, 409} The dynamic muscle-bone balance of the back was carefully studied by Carey; illustrations of his models graphically portraying this balance were published. According to Carey, muscle imbalance itself can lead to permanent structural changes in the spinal column.

The famous epigram "A woman is a constipated biped with a pain in her back" was attributed to Dr. Henry I. Prentiss.⁴²⁹ It is a common practice of physicians, in cases of backache even when roentgenograms fail to show any abnormality to dispose of the complaint with the remark, "There must be a small spot of rheumatoid arthritis somewhere." This is unsound practice, according to Lang, because cases in which spinal rheumatoid arthritis is isolated and confined to one spot in the spinal column or sacro-iliac joint are rare.

Lumbosacral and Sacro-iliac Back Strain: "Industrial Backache." The tendency for industrial surgeons to lump cases of backache among working men under the term "industrial backache" was deplored by Johnstone. A diagnosis of "industrial backache" (presumably related to injury) was found to be unjustified in from 70 to 80 per cent of cases so styled and in these cases no injury to account for the complaints had been experienced. In only about 30 per cent of the cases was the condition regarded as compensable because of true industrial trauma. The so-called industrial back is not primarily a problem for the orthopedist but "represents a problem in differential diagnosis for the internist."

Muscular and ligamentous strains are still considered to be the commonest causes of chronic backache.^{328, 363} Cases of transient acute backache with acute onset of pain after mild or major trauma are generally presumed (if fractures, etc. are ruled out) to result from subluxation of one of the intervertebral joints or an incomplete tear of an adhesion in periarticular tissues (Little). Despite such presumptions there is little evidence that